

ABSTRACT OF THE DISCLOSURE

In the case where variations in ground objects in one and the same area are detected between a line drawing map describing profile lines of the ground objects or a reference line drawing/image obtained by picking up the ground objects from above, and a target image obtained by picking up the ground objects in the same area from above later on, a variation detecting apparatus collates the reference line drawing/image with the target image so as to obtain variation indexes indicating whether there are variations or not in the ground objects respectively, and displays ground objects which can be judged to have variations or ground objects which cannot be judged as to whether there are variations or not on the basis of the variation indexes, in a display mode in which an area of the reference line drawing/image including the ground objects and an area of the target image including the ground objects can be compared with each other. Accordingly, confirmation or update of variations of ground objects on a line drawing map can be coped with easily, and portions having variations can be selectively displayed so that portions where variation detection should be confirmed can be understood intuitively.

[Fig. 1]

- 101 line drawing/image storage unit
- 102 newly picked-up image storage unit
- 103 detection result storage unit
- 104 confirmation result storage unit
- 105 processing unit
- 106 display unit
- 107 input unit
- 108 variation detecting information input/output unit
- 110 line drawing/image collating means
- 111 variation detecting means
- 112 line drawing editing means
- 113 detection result displaying means
- 114 detection result confirming means
- 115 confirmation result recording means
- 116 confirmation result outputting means
- 117 confirmation result inputting means

[Fig. 2]

START

- 201 Collate reference line drawing/image with image as a
variation detecting target.

202 Compute variation index between ground object area of
reference line drawing/image and ground object area of
new image.

203 Is visual confirmation required?

204 Make display for visual confirmation.

205 Is variation present?

206 Is it confirmed as variation presence?

207 Make setting into variation presence.

208 Is reference line drawing updated?

209 Edit line drawing.

210 Is information outputted?

211 Output variation information.

END

[Fig. 3]

301 line drawing map

311 ground object area

302 newly picked-up image

312 ground object area

[Fig. 6]

legend

target for visual confirmation

[Fig. 13]

1303 processing unit

1304 display unit

1305 input unit

1306 variation detecting information input/output unit

transmission/reception on communication line or through medium

1307 accounting unit

1308 processing unit

1309 execution permission management unit

1310 line drawing/image storage unit

1311 newly picked-up image storage unit

1312 detection result storage unit

1313 confirmation result storage unit

1314 processing program storage unit

1315 line drawing/image collating means

1316 variation detecting means

1317 line drawing editing means

1318 detection result displaying means

1319 detection result confirming means

1320 confirmation result recording means

1321 confirmation result outputting means

1322 confirmation result inputting means

[Fig. 14]

1302 center apparatus

1401 reference line drawing

1402 accounting process

1403 target image

1404 accounting process

1405 processing program

1406 accounting process

1407 execution permission information

1408 accounting process

1414 refund process in accordance with feedback/supply of
information

1301 variation detecting apparatus (user terminal)

1303 processing unit

1410 updated reference drawing line

1411 investigation into the status quo of permanent assets
on the basis of variation information

- 1412 updating of map on the basis of variation information
- 1413 collection efficiency of attribute information such as classifications of buildings, owners thereof, and so on, on the basis of variation information

[Fig. 15]

processes in center apparatus

- 1501 Receive designation area processing request designated in latitude and longitude, and so on, by variation detecting apparatus.
- 1502 Is reference line drawing requested?
- 1503 Send reference line drawing.
- 1504 Make accounting in accordance with sent quantity.
- 1505 Is target image requested?
- 1506 Send target image.
- 1507 Make accounting in accordance with sent quantity.
- 1508 Is processing program requested?
- 1509 Send processing program.
- 1510 Make accounting in accordance with the content of processing program.
- 1511 Is execution permission requested?
- 1512 Send execution permission.

1513 Make accounting in accordance with the content of
execution permission.

1514 Execute detection processing by processing unit.

1515 Send updated reference line drawing to center apparatus
side.

1516 Is fed-back information a refund subject?

1517 Calculate reward in accordance with fed back information
quantity from user terminal side.

1519 Does user who has fed back information have update
authorization?

Yes No

1520 Reflect and update fed-back information from user
terminal side on reference line drawing.

terminate detection processing cycle

[Fig. 16]

(a)

screen example on user terminal side

range designation in latitude and longitude

latitude range

longitude range

(b)

designation of place name

prefecture name

Kanagawa Prefecture

city/ward/town/village name

Yokohama City Naka Ku

section/street

Onoue Chou 6 Chou-Me

block

71

(c)

designate range on map

latitude

longitude

[Fig. 17]

(a)

variation detecting screen

position

latitude

longitude

(b)

1706 new entry

1705 correct

1704 attribute information

owner XXX Yamada

classification residence

structure mortared frame house

lot area xxx m²

land category first-class exclusive residential

district

floor space yyy m²